

I CLAIM

1. A data processing apparatus comprising:
 - a processor;
 - an n-way set associative cache having a plurality of entries, each entry being arranged to store one or more data values and a corresponding address identifier, the processor being operable to select one or more of the n-ways to operate in a lockdown mode, the lockdown mode being used to lock data values into the corresponding way; and
 - a plurality of lockdown controllers, each lockdown controller being associated with a corresponding way, each lockdown controller comprising:
 - an address register arranged to store an address range specified by the processor such that, when the corresponding way is in the lockdown mode, only data values whose address identifiers are within the address range are locked into the corresponding way.
- 15 2. The data processing apparatus of claim 1 wherein each lockdown controller further comprises a mode indicator for identifying when the lockdown mode has been selected for the corresponding way.
- 20 3. The data processing apparatus of claim 2 wherein the mode indicator comprises an enable lockdown flag, the lockdown mode being selected when the enable lockdown flag is set by the processor.
- 25 4. The data processing apparatus of claim 2 wherein the mode indicator further comprises a disable unlocked allocation flag, the corresponding way being prevented from storing any unlocked data values when the disable unlocked allocation flag is set.
5. The data processing apparatus of claim 1 wherein the number of addresses in the address range equals the number of entries in the corresponding way.

6. The data processing apparatus of claim 1 wherein the number of addresses in the address range is less than the number of entries in the corresponding way.

7. The data processing apparatus of claim 1 wherein the cache further comprises a 5 lockdown field for each entry which is set to indicate that the one or more data values in that entry are locked.

8. The data processing apparatus of claim 7 wherein each entry comprises a cache line and the lockdown field comprises one bit.

10

9. A lockdown controller for a data processing apparatus as claimed in claim 1, comprising:

an address register arranged to store an address range specified by the processor such that, when the corresponding way is in the lockdown mode, only data values 15 whose address identifiers are within the address range are locked into the corresponding way.

10. A method of locking data values in a way of an n-way set associative cache, the cache having a plurality of entries, each entry being arranged to store one or more data 20 values and a corresponding address identifier, the method comprising the steps of:

a) selecting a way to operate in a lockdown mode;
b) storing an address range specified by a processor in an address register of a lockdown controller associated with the way selected at step (a); and
c) upon receipt of a data value at the cache, locking the data value in the 25 way selected at step (a) if the corresponding address identifier is within the address range.

11. The method of claim 10 wherein the step of selecting the lockdown mode comprises enabling a lockdown flag within the lockdown controller.

30

12. The method of claim 10 wherein the step of locking comprises setting a

lockdown field provided with the cache for the entry into which the data value is stored.